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Title: Electrical and Electronic Engineering
Status: Definitive
Code: **4107MECH** (121280)
Version Start Date: 01-08-2021

Owning School/Faculty: Engineering
Teaching School/Faculty: Engineering

Team	Leader
Michael Shaw	Y

Academic Level: FHEQ4 **Credit Value:** 20 **Total Delivered Hours:** 68
Total Learning Hours: 200 **Private Study:** 132

Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	22
Online	22
Tutorial	22

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS2	Examination	60	2
Test	AS1	Coursework - VLE Based Tests	40	

Aims

To enable students to develop an understanding of the physical principles of electrical and electronic systems, and to analyse simple circuits which incorporate passive and active components.

Learning Outcomes

After completing the module the student should be able to:

- 1 Describe and model the physical principles of electrical and electronic systems.
- 2 Analyse circuits which include passive electrical components.
- 3 Analyse circuits which include active electronic components.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Examination	1	2	3
V.L.E. based test	1	2	3

Outline Syllabus

Physical Principles of Electrical & Electronic Systems

- *Charge, Current and Voltage*
 - *Ohms Law*
- *Conductivity & Resistance*
- *Power & Dissipation of Losses*
- *Capacitance*
- *Magnetism & Inductance*
- *Motor and generator effects*
- *Electrochemical & Batteries (increasingly important given hybrid systems)*
- *Semi-conductors*
 - *P-type, N-type*
 - *Diodes and Transistors*
- *Basic Operational Amplifiers*
- *Fundamentals of A.C. (Sinusoids, Phasors etc)*

Electrical Circuits

- *Kirchhoff's Voltage and Current Laws (LO1 & LO2)*
- *Resistive circuits in series and parallel (LO2)*
- *Simple inductive and capacitive circuits (LO2)*
 - *RC, RL and RLC circuits*
 - *Complex representation*
- *Active Electrical Circuits (LO3)*
 - *Transistor and diode circuits.*
 - *Inverting & Non-Inverting Amplifiers*
 - *Summing, Integrating and Differentiating Circuits.*
- *Useful engineering circuits (LO2 & LO3)*

- *Instrumentation, sensors and measurement (LO1, LO2 & LO3)*

Learning Activities

Lectures and tutorials

Notes

This module is designed to provide an introduction to Electrical and Electronic Engineering relevant to the fields of Mechanical, Automotive and Marine Engineering. The module covers the essential concepts associated with DC and AC circuits, electromechanical systems and instrumentation